Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-34. (Canceled)

35. (New) A method for producing a sample for processing or analysis comprising:

a) introducing a sample into a mixing chamber containing a suspension fluid, wherein the sample is either in solid form or is in liquid form immiscible with the suspension fluid, so that the sample is a discrete sample immersed in the suspension fluid, and wherein the sample moves from an inlet to an outlet of the mixing chamber; and

b) introducing one or more reagents into the mixing chamber, wherein the one or more reagents are either in solid form or are in liquid form immiscible with the suspension fluid, so that each of the reagents is a discrete reagent immersed in the suspension fluid, and wherein each of the reagents moves from the inlet and contacts the sample at a location in the mixing chamber before the sample reaches the outlet of the mixing chamber;

wherein the location of contact between the sample and the one or more reagents in the mixing chamber is predetermined by predetermining the rate of movement of the sample and of each reagent within the suspension fluid, and wherein the sample mixes with the one or more reagents upon contact to form a processed sample for further processing or analysis.

36. (New) A method as in claim 35 wherein the rate of movement of the sample and of each reagent in the suspension fluid of known density is predetermined by selecting the size and density of the sample and/or the size and density of each reagent.

37. (New) A method as in claim 35 wherein the rate of movement of the sample and the rates of movement of each reagent are such that the sample contacts and mixes with each reagent as it moves in the mixing chamber.

38. (New) A method as in claim 35 wherein the mixing chamber has a tapered portion to assist contact of the sample with each reagent by causing the sample and each reagent to converge as they move in the mixing chamber.

39. (New) A method as in claim 35 wherein the sample contacts and mixes with a single reagent in the mixing chamber.

40. (New) A method as in claim 35 wherein the sample contacts and mixes with two or more reagents in the mixing chamber.

41. (New) A method as in claim 40 wherein the two or more reagents contact and mix with the sample at substantially the same time.

42. (New) A method as in claim 40 wherein the rates of movement of the sample and of each of the two reagents are predetermined so that the sample contacts and mixes with a first reagent and then contacts and mixes with a second reagent, and optionally with further reagents successively.

43. (New) A method as in claim 35 wherein the mixing chamber is orientated vertically.

44. (New) A method as in claim 43 wherein the sample and the one or more reagents are introduced at or near to the top of the mixing chamber and descend in the suspension fluid.

45. (New) A method as in claim 43 wherein the sample and the one or more reagents are introduced at or near to the bottom of the mixing chamber and ascend in the suspension fluid.

46. (New) A method as in claim 35 wherein the sample is an extract from a biological sample selected from the group consisting of blood, serum, semen, saliva, urine, and milk.

47. (New) A method as in claim 35 wherein the sample is an extract obtained from meat, fat, bone, hair, skin, faeces, plant material or a microbial habitat.

48. (New) A method as in claim 35 wherein the sample is a non-biological sample selected from the group consisting of water from waterways, industrial wastes, and hazardous or non-hazardous chemicals, including radioactive materials.

49. (New) A method as in claim 35 wherein the one or more reagents are selected from the group consisting of Tris buffer, water, magnesium chloride, an oligonucleotide, a DNA template, a deoxyribonucleoside triphosphate, and a thermostable DNA polymerase.

50. (New) A method as in claim 35 wherein the suspension fluid is a hydrocarbon oil.

51. (New) A method as in claim 50 wherein the hydrocarbon oil is paraffin.

52. (New) A method as in claim 35 wherein the introduction of the one or more reagents is controlled by detecting the introduction of the sample and sending a signal to a device controlling the introduction of the one or more reagents.

53. (New) A method as in claim 35 wherein the flow rate of suspension fluid through the mixing chamber is regulated.

54. (New) A method as in claim 35 wherein the suspension fluid is introduced into the mixing chamber to maintain a constant level of the suspension fluid within the mixing chamber.

55. (New) A method as in claim 35 wherein the sample is in liquid form immiscible in the suspension fluid.

56. (New) A method as in claim 35 wherein the sample is in solid form.

57. (New) A method as in claim 56 wherein the sample is a coated magnetized bead or a lyophilized mass of solid.

58. (New) An apparatus for producing a sample for processing or analysis comprising:

a) a mixing chamber;

b) one or more inlets for introducing a suspension fluid into the mixing chamber;

c) one or more inlets for introducing a sample for processing or analysis into the mixing chamber;

d) one or more inlets for introducing one or more reagents into the chamber; and

e) an outlet to enable a processed sample to exit the mixing chamber.

59. (New) An apparatus as in claim 58 further including a device downstream of the outlet for analyzing the processed sample.

60. (New) An apparatus as in claim 59 wherein the device is a PCR thermocycler, a spectrophotometer, a fluorescence detector, an incubator or reaction chamber, a chemiluminescence detector, a bioluminescence detector, a scintillation counter, a diverter, a sorter, or a fraction collector.

61. (New) An apparatus as in claim 58 further comprising a second mixing chamber connected in series to a first mixing chamber.

62. (New) An apparatus as in claim 58 further comprising a detector to detect the introduction of the sample and a device to receive a signal from the detector wherein the device controls the introduction of the one or more reagents.

63. (New) An apparatus as in claim 58 further comprising a detector to detect the level of the suspension fluid and a device to receive a signal from the detector wherein the device controls the introduction of the suspension fluid to maintain a constant level.

64. (New) An apparatus as in claim 58 wherein the mixing chamber is closed to the atmosphere and the mixing chamber is under a positive pressure to assist the flow of the suspension fluid from the suspension fluid inlet to the outlet.

65. (New) An apparatus as in claim 58 wherein the mixing chamber is open to the atmosphere and a negative pressure is applied to the outlet of the apparatus to assist the flow of the suspension fluid from the suspension fluid inlet to the outlet.

66. (New) An apparatus as in claim 58 wherein the outlet is integrally formed with an outlet conduit having a bore diameter in the range of 50 μm to 10 mm.

67. (New) An apparatus as in claim 58 wherein the outlet is an opening adapted for connection to an outlet conduit having a bore diameter in the range of 50 μm to 10 mm.

68. (New) An apparatus as in claim 58 further comprising a co-axial injector having an inner bore from which the sample or each reagent is introduced into the mixing chamber and an outer layer containing suspension fluid wherein suspension fluid flows from the outer layer into the mixing chamber in a manner which assists each sample or reagent to move from the end of the inlet into the mixing chamber.